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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/086,304

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Peter P. Pronko

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EXAMINER

WONG, EDNA

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 01/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/086,304

Applicant(s)

PRONKO ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) 29-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8/23/02.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Election/Restrictions

Applicant's election with traverse of Group I, claims **1-28**, in the Response dated December 17, 2003 is acknowledged. The traversal is on the ground(s) that the invention of Groups I, II and IV, being in the same class and within the closely classified subclasses, does not pose an undue burden for examination on the Examiner. This is not found persuasive because the methods of Groups I, II and IV contain steps that are methodically different from each other and are not required for each of the Groups. It would be a burden on the Examiner to search for the specifics for each Group when they are not even required for each Group.

For example, the Examiner has found a method for separating isotopes. The Examiner would have to do a separate search in a separate area for finding vaporizing an aggregate in a plasma.

The requirement is still deemed proper and is therefore made FINAL.

Accordingly, claims **29-46** are withdrawn from consideration as being directed to a non-elected invention.

Specification

The disclosure is objected to because of the following informalities:

page 1, line 2, the words -- now US Patent No. 6,586,696 -- should be inserted after the number "09/914,401".

Appropriate correction is required.

Claim Objections

Claim 12 is objected to because of the following informalities:

Claim 12

line 2, it is suggest that the word "first" be deleted since the word "second " does not appear anywhere in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

I. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hora et al. (US Patent No. 4,199,685) in combination with JP 6-79141.

Hora teaches a method for separating isotopes of an element comprising the steps of:

(a) directing a first laser pulse **P** onto a surface of a target **T** at a first energy fluence sufficient to generate a plasma (= cold plasma) comprising ionized isotopic

species **I** and to cause spatial separation of said ionized isotopic species;

(b) directing a second laser pulse **P** onto said plasma at a second energy fluence to further spatially separate said ionized isotopic species (col. 6, lines 6-17); and

(c) depositing said spatially separated ionized isotopic species on a substrate **FC** (col. 5, line 8 to col. 6, line 1; and Fig. 1a).

The second energy fluence is not equal to said first energy fluence (col. 6, lines 3-59).

Hora does not teach after step (a), allowing said plasma to expand to a density approximately equal to a critical density of said plasma.

However, the JP reference teaches that when the density of the plasma is high, ions can be quickly collected to an electrode in a predetermined time amount, and the effectiveness and the amount of products of isotope separation by laser can be made to increase as a result (page 2, ¶ [0014], of the English translation).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because one skilled in the art would

have been motivated to have modified the method of Hora by after step (a), allowing said plasma to expand to a density approximately equal to a critical density of said plasma because when the density of the plasma is high, ions can be quickly collected to an electrode in a predetermined time amount, and the effectiveness and the amount of products of isotope separation by laser can be made to increase as a result as taught by the JP reference (page 2, ¶ [0014], of the English translation).

As to wherein said critical density further comprises a density of said plasma when a frequency of said plasma approximately equals a frequency of said second laser pulse, the skilled artisan has sufficient knowledge to select the appropriate density to induce the highest separation of the isotopes. A critical density comprising a density of said plasma when a frequency of said plasma approximately equals a frequency of said second laser pulse appears to be a mere optimization which solves no stated problems and produces no unexpected results, unless proven otherwise.

As to extracting said spatially separated ionized isotopic species using a carrier gas, since the produced group of particular isotopes of a given element differ from each other in their velocities, a carrier gas would have advanced the particular isotopes to a collection area.

As to wherein said first and second energy fluences are approximately equal to 1.1 kJ/cm^2 ; and wherein the second energy fluence is approximately equal to said first energy fluence, the first and second energy fluences are result-effective variables and one skilled in the art has the skill to calculate the energy fluences that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

As to wherein said step (b) progresses from about 1 to about 40 picoseconds; wherein said step (b) progresses from about 3.5 to about 11.5 picoseconds; wherein said step (b) progresses for about 5 picoseconds; and wherein said step (b) progresses for about 10 picoseconds, the expansion time is a result-effective variable and one skilled in the art has the skill to calculate the expansion time that would determine the success of the desired reaction to occur, absent evidence to the contrary. MPEP § 2141.03 and § 2144.05(b).

Furthermore, Hora teaches that one pulse of preferably 1 to 50 picoseconds and a sequence of such pulses has a frequency of 10^6 per second or more (col. 6, lines 6-17). It appears that an allowance of expansion of at least between from about 1 to about 40 picoseconds from about 3.5 to about 11.5 picoseconds would have been obvious to the artisan.

II. Claims **12-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hora et al.** (US Patent No. 4,199,685) in combination with **JP 6-79141**.

Hora et al. and JP 6-79141 are as applied for the same reasons as discussed above in **I.** and incorporated herein.

Hora also teaches depositing said spatially separated ionized isotopic species on a substrate whereby a deposit is formed having a region with a second isotopic distribution different from said first isotopic distribution (col. 5, line 49 to col. 6, line 2; and Figs. 2 and 3).

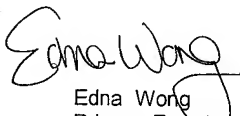
III. Claims **23-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hora et al.** (US Patent No. 4,199,685) in combination with **JP 6-79141**.

Hora et al. and JP 6-79141 are as applied for the same reasons as above **II.** and incorporated herein.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 5:00 pm, alt. Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1495.


Edna Wong
Primary Examiner
Art Unit 1753

EW
January 8, 2004